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TRAINING IN DISCRIMINATION OF SIZE WITH SOLID INSETS

THE MONTESSORI SYSTEM

IN THEORY AND PRACTICE

AN INTRODUCTION TO THE
PEDAGOGIC METHODS OF
DR. MARIA MONTESSORI

BY
DR. THEODATE L. SMITH
OF CLARK UNIVERSITY

WITH SOME REPORTS OF
AMERICAN EXPERIENCE

ILLUSTRATED FROM
PHOTOGRAPHS TAKEN
FOR THIS BOOK

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CONTENTS

CHAP.		PAGE
	INTRODUCTION	vii
I.	DR. MARIA MONTESSORI	1
II.	PRINCIPLES OF THE METHOD	6
III.	A MONTESSORI SCHOOL	11
IV.	WRITING AND READING	23
V.	NUMBER AND ARITHMETIC	35
VI.	DISCIPLINE	41
VII.	PHYSICAL DEVELOPMENT	46
VIII.	RESULTS IN PRACTICE	50
IX.	APPLICATION IN AMERICAN EDUCATION	58
X.	AN AMERICAN TEACHER'S EXPERIENCE	69

ILLUSTRATIONS

TRAINING IN DISCRIMINATION OF SIZE WITH SOLID INSETS	*Frontispiece*	
LEARNING TO DISTINGUISH TEXTILES BY TOUCH	*Page*	9
LEARNING TO SEE WITH THE FINGERS	"	13
TRAINING THE TACTILE AND MUSCULAR SENSES	"	17
TRAINING IN COLOR DISCRIMINATION	"	21
PRELIMINARY MOVEMENTS OF WRITING	"	25
LEARNING LETTERS BY TOUCH	"	29
MAKING WORDS WITH MOVABLE LETTERS	"	33
THE LONG STAIR	"	37
LEARNING TO BUTTON	"	53
THE BROAD STAIR—DISCRIMINATION OF FORM AND SIZE	"	61
LEARNING TO TIE	"	67
LEARNING TO HOOK	"	71
USING GEOMETRIC INSETS	"	75

Photographs by Paine, Providence

INTRODUCTION

THIS book, written by an American student of pyschology and pedagogy, and including the results of American experience, affords an introductory explanation of the new system of elementary education which has been devised as the result of years of scientific research by Dr. Maria Montessori, of Rome.

Dr. Montessori, lecturer on anthropology at the University of Rome, familiarized herself with the Séguin method, and devoted years to the study of experimental psychology and anthropological pedagogy. She developed as fundamental principles of her method the complete liberty of the child in its spontaneous manifestations, and the utilization of every atom of its natural energy. Reward comes in the child's own sense of mastery. Failure is a negation showing that the child is not yet ready for that particular exercise.

Children are taught to care for themselves. They are allowed the pleasure of finding out how to do things themselves. There is a system of

sense-training with the use of materials whose forms are based on scientific experiment and the most modern lessons of psychological research. Dr. Montessori seeks to remove obstacles and let the child develop himself through self-correction. The result in the first stage and in the intelligent mastery of reading, writing, and numbers is now attracting the attention of educators and parents.

Harvard University, through Professors Henry W. Holmes and Arthur O. Norton, was probably first in this country to devote serious study to the Montessori system. It has been studied with care at Clark University. Columbia University has sent three members of the faculty to Rome for the examination of Madame Montessori's work, and several other universities are investigating the method. So far as American schools are concerned, mention may be made of the school of Miss Anne E. George, a student under Madame Montessori and the translator of her book. In other schools certain selections or adaptations have been used. This, for example, has been done by Miss Mary Jackson Kennedy, in Miss Wheeler's school in Providence, and also in Mrs. Leatherby's school in Boston, and the application of certain principles, without any claim or desire to apply the complete method, has doubtless been tried at many other schools, and sometimes in homes. There is an obvious interest in learning the re-

sults of American application of the system, even though they may have been "unofficial," and therefore certain results of the work in practice are presented by Miss Kennedy.

Certain other points in regard to this book may properly be emphasized. It is intended to call the attention of teachers to the principles that are applicable under American conditions, in distinction from incidental results which, though occurring among Italian children, are not possible in a *non-phonetic* language. It is also especially addressed to mothers who, having no time to study systems of education in detail, wish to have an intelligent comprehension of the best that is being done in education, that they may choose wisely for their children. It may be repeated that this is designed to be simply an American introduction to a system which is explained in detail in Madame Montessori's own book.

THE MONTESSORI SYSTEM

THE MONTESSORI SYSTEM

I

DR. MARIA MONTESSORI

WITHIN the last few years an experiment in elementary education has been going on in Rome which is productive of such remarkable results that it is attracting wide-spread interest in all educational circles. In Dr. Maria Montessori's *Case dei Bambini*, children from four to five years old read, write, and do number work with a facility equal to that of children of the second and third grades, and this result has come about with no overexertion on the part of the child and without the slightest forcing, but as a process of normal development. Dr. Montessori's method is due to no fortuitous circumstances, but is the result of years of scientific research, and is founded on anthropological and psychological

principles. The first woman to receive the degree of M.D. from the University of Rome, while acting as assistant in the Psychiatrical Clinic of the same institution, she became interested in the education of feeble-minded children, and devoted herself to the study of this problem. She made herself thoroughly familiar with the work of Séguin, whose book of more than six hundred pages she translated into Italian, writing with her own hand the entire manuscript copy, because, as she says, she wished to weigh each sentence and assimilate the spirit of the author. Few students would voluntarily undertake such a piece of drudgery, but Dr. Montessori's enthusiasm hesitated before no amount of labor that would help her to accomplish her purpose of finding a scientific basis for elementary education. Having made herself thoroughly familiar with the work of Séguin, and Itard's experiment with the savage of Aveyron, she went to Paris to investigate the method as used in the Bicêtre. Here she became convinced that even in the original school it was Séguin's didactic apparatus, rather than his method, which was in use. It is probable, however, that Séguin's influence and teaching are really better represented in the United States than in his own country.

Thoroughly imbued with a belief in the value of Séguin's ideas, Dr. Montessori returned to

Italy, and as a result of her lectures on the education of the feeble-minded, given at Turin and Rome in 1898, she was appointed director of a new school, the *Scuola Magistrali Ortofrenica*, which for two years she conducted with great success. At the end of that time she re-entered the philosophical department of the University of Rome, and devoted herself to the study of experimental psychology and anthropological pedagogy, continuing the work for seven years and making investigations in the schools and in the psychological laboratories of Italy. In 1906 an opportunity for trying upon normal children the methods worked out upon the feeble-minded was offered to her through Edoardo Talamo, the head of a real-estate society, which was part of a scheme for social betterment in Rome. In the group of tenement-houses managed by this association, between January, 1907, and November, 1908, four schools for children of these tenements were established. For these home schools the following rules were announced:

"Attention must be paid to the health and the physical and moral development of the children by means of lessons and exercises adapted to their age.

"There will be in charge of each *Casa dei Bambini* a directress, a physician, and a caretaker. All children in the block between the ages

of three and seven years have the right of admission to the *Casa dei Bambini*.

"The parents of children attending the *Casa dei Bambini* pay no contribution whatever, but they assume these imperative obligations: A. To send at a specified hour their children to the schoolroom, clean in person and clothing, and with a suitable pinafore. B. To show the greatest respect and deference toward the directress and all other persons connected with the *Casa dei Bambini*, and to co-operate with the directress in the work of educating their children. At least once a week mothers will be able to speak with the directress, reporting observations on their own children in their home life, and receiving from the directress notes and suggestions for the welfare of the children.

"There will be expelled from the *Casa dei Bambini*, (a) those who present themselves in an unwashed and slovenly condition, (b) those who show themselves not amenable to discipline, and (c) those whose parents fail in respect to those placed in charge of the *Casa dei Bambini*, or who destroy by bad conduct the educational work which is the aim of the institution."

As a further incitement to the keeping of these rules, the report from the *Casa dei Bambini* was to be taken into consideration in the yearly award of prizes offered by the society for the best-

kept tenement. The greatest difficulty in carrying out the experiment was naturally in obtaining teachers or directresses, as they are called, who were both adapted by nature and sufficiently trained in the principles of Dr. Montessori's method to conduct the work successfully. This will probably always be one of the chief difficulties in the successful application of the method, but the work has passed beyond its beginnings, as part of a sociological experiment, to private schools for children of the more fortunate classes, and is beginning to be introduced into public-school systems not only in Italy, but in other European countries. In Italian Switzerland there are now seventy schools conducted by Dr. Montessori's method.

II

PRINCIPLES OF THE METHOD

THE fundamental principles which distinguish Dr. Montessori's method are the complete liberty of the child in its spontaneous manifestations and the utilization of every atom of its natural energy.

True discipline can be founded only on liberty, and must necessarily be active and not passive. A child who has been reduced to silence and immobility, who does only what he is told to do, is a paralyzed, not a disciplined child. Such repression may be a convenience in the schoolroom, but it does not fit the child for actual life, for it is the individual trained in habit and practice to regard his own rights as limited by the collective interest of the group who comes into the social community fully adapted to it. The first notion that the child must acquire in order to be actively disciplined is that of good and bad, and it is the part of the teacher to hinder him from confusing goodness with immobility and badness with activity, a confusion all too frequent as a

result of school discipline. To Dr. Montessori a school where all the children move purposefully and intelligently, without incommoding any one, is well disciplined. The child must be trained to self-control, though his environment can act in two opposite ways. It can help or it can hinder development, and to supply the conditions that will suffocate bad tendencies and favor the development of good ones is to truly educate the child to self-discipline. Dr. Montessori calls a child disciplined who is master of himself, and therefore able to dispose of or control himself whenever he needs to follow a rule of life. The liberty of the child must have as its limit only the collective interest. He must then be hindered from any acts offensive or harmful to others. All else that he does must not only be permitted but observed by the teacher, and the teacher must have not only the capacity, but the interest to observe this natural development. She must avoid rigorously the repression of spontaneous acts and the imposition of work at the will of another. To interfere with this spontaneity is, in Dr. Montessori's view, perhaps to repress the very essential of life itself. The aim of discipline is to train to activity, to work, for the welfare of self and of others. To this end the development of independence in the child is necessary. So long as he is served by others and

dependent upon them, dressed and undressed, fed, and so forth, he is not free. But if properly trained he ought to be able to do these things for himself by the time he is three years old. It is, of course, far easier to feed and to dress a child than it is to teach him to do it for himself, but the first is the work of a servant, and the latter of an educator.

In Dr. Montessori's system rewards and punishments are banished. Reward comes in the child's own sense of mastery. Failure is a mere negation, to be taken as a sign that the child is not yet ready for that particular exercise. The teaching is almost entirely individual, and the three fundamental rules for lessons are that they shall be brief, simple, and objective. No superfluous words must be used in giving the lesson, since they tend to confuse the child and to distract his attention from the main point, and the teacher must not insist on the repetition of a lesson against the child's inclination, and she must not let the child know that he has failed or has not understood.

LEARNING TO DISTINGUISH TEXTILES BY TOUCH

III

A MONTESSORI SCHOOL

IF one visits one of Dr. Montessori's schools, the children all seem to be occupied in interesting play. Some are lying on the floor playing with blocks or strips of wood painted in different colors. Some are playing blindfold games, finding out by the aid of their fingers alone the shapes and sizes of objects, and different textures of silk, satin, wool, or linen. One child who was absorbed in writing on the blackboard did not even notice my entrance into the room. She was writing in large vertical script and forming the letters beautifully, and in answer to my question as to how long she had been writing I learned that she had begun the day before. Occasionally some child called the teacher when he had finished his game, and received either approval or a suggestion that perhaps he would like to do something else. But the interest and the attention of the children are never interfered with. If a child wishes to spend the entire school period of two hours in doing one thing, he is allowed to do so on the

principle that the spontaneous attention is a fundamental educative principle which must not be interfered with. In spite of the fact that this particular school in the convent on the Via Giusti draws its children from an exceedingly poor section in Rome, their appearance was neat, and although no discipline was apparent the school-room was in the truest sense controlled and orderly.

The first item in the order of the day's exercises when the children arrive, at nine o'clock (for in this particular school the children are cared for from nine until half past five, although only two hours or at most two hours and a half are devoted to school work), is a visit to the toilet-rooms, where they are taught to wash their hands and their faces, necks and ears, and to put on their pinafores, which they do for themselves or by helping each other. Then comes a tour of inspection of the school-room, to see that everything is in perfect order, to detect if there is any dust left in corners or if anything is out of place, that any deficiencies in this line may be remedied by the children themselves. There is also play in the garden until ten o'clock.

As the pedagogical method has been developed from methods used with feeble-minded children, many of the things which the younger children are doing are familiar to those who have seen the

LEARNING TO SEE WITH THE FINGERS

instruction in the schools for defectives. Various items in the way of motor-training, buttoning and unbuttoning, tying and untying, hooking and unhooking, lacing, and so forth, are all a part of the lessons of the little ones. But they differ from the training of the feeble-minded, in that they are lessons which the child works out for himself. He is allowed the pleasure and the triumph of finding out how to do things himself. To a certain extent imitation comes in, since he sees the other children doing these things. There is also a regular system of sense-training. In this sense-training some of the materials used are the regulation kindergarten gifts. In other cases they are materials devised by Dr. Montessori or every-day objects which are adapted to the purpose, for Dr. Montessori's fundamental principle when she began her work was to study all systems but to be bound by none.

She kept as her fundamental principle Wundt's saying that all methods of experimental psychology are reducible to one, that of controlled observation, and her system has been worked out by this method of individual observation of the child and consists in giving it the environment adapted to individual normal growth. The touch- and muscle-sense, which seem to have fallen into disuse in the teaching of normal children, Dr. Montessori has reintroduced from her experience

in the training of defective children, and in the plays and lessons constant use is made of the principle of establishing the associations between visual, muscular, tactile, and auditory sensations. For example, in the sight-training, the children have a set of cubes graded from large to small. They are given these to pile up in the graduated order. They are taught to run their fingers along the outlines and thus connect the tactile, muscular, and visual sensations. Then they have blindfold games, in which the blocks are piled wholly by the sense of touch, the children finding a great delight in discovering, when the bandage is taken from their eyes, that they have "seen with their fingers."

For training the color-sense a series of tablets or silk winders wound with either silk or wool in eight colors is used. Each color is represented in eight different intensities, and various games are played with these tablets, until the children grow expert in matching and grading them. Children of three years become able to rapidly arrange in all their graduations these sixty-four tablets. It is interesting to note that in comparison with the experimental investigations of the color-sense of children made by psychologists this result far surpasses the usual attainments of children in color-discrimination; though Dr. Millicent Shinn, who has made the most compre-

hensive study of the development of the senses in the first three years of childhood, concludes in respect to the color-sense that during the fourth half-year some children can learn to distinguish and name all the colors as well as any adult, though they probably see them as somewhat less saturated, and that all children not color-blind are able to do so in the first half of the third year.

There are also some exercises in discrimination of sounds, tastes, and smells, though the two latter are of less importance educationally. All this sense-training finds its immediate application in practical life.

Although the method has been developed from that originally used in training feeble-minded, it is by no means simply a method for training deficients transferred to normal children. Much of the material valuable for the training of mental defectives has been omitted, many of the objects used have been modified, and many others added. Moreover, there is a fundamental difference between the reactions of the normal and the feeble-minded child even when the same material is used. The latter needs for his first sense-training strong stimuli, presented with sharp contrasts. He must be constantly encouraged and his errors repeatedly corrected. The normal child shows interest in graded stimuli from the beginning, spontaneously repeats the exercise, and by means

of the material corrects his own errors. The cylinders graded in size, for instance, are one of the later things to be used for the feeble-minded child, and one of the first to hold the interest of the normal child. As Dr. Montessori expresses it, the material makes education possible for the deficient child, while in normal children it provokes auto-education.

TRAINING IN COLOR DISCRIMINATION

IV

WRITING AND READING

IN her first school Dr. Montessori found that her children from three and a half to four and a half years old were already fairly expert in the preliminary training. They could dress and undress themselves, that is, they had learned to apply practically their various exercises in buttoning, unbuttoning, lacing, tying, etc.; they had learned to be neat in person, they had had considerable sense-training, and they were eager for something more, in fact they clamored to be taught to read and write, and the experiment was tried with surprising results. The writing came first. Dr. Montessori had learned by her experience with feeble-minded children that in the process of learning to write the mechanism of muscular control and holding the pen should precede the mental effort of learning to write. The child should not be set to the task of learning to manage a pen and produce certain forms at the same time. The didactic materials for training the muscular mechanism and for holding and managing in-

struments of writing are, for the first step, either solid or outline forms of triangles, squares, and other geometrical figures, made of metal, cardboard, or wood. The child traces the outline of these and is then given a colored pencil of large size, to fill them in. No directions as to manner of holding the pencil or of making the marks are given to the child. His movements are left free and unconstrained. At first, naturally, the filling is irregular, often exceeding the outline or failing to touch it at every point, but the children enjoy playing with these colored forms and gradually the strokes become even and the space is accurately filled in. When this happens the child is ready for the next step, but a week is usually allowed to elapse before it is taken. Script letters of large size cut from fine emery-paper are pasted upon squares of cardboard, the vowels being light-colored on a dark background and consonants dark on a light background. Movable letters are also cut from pasteboard, and the alphabets thus formed are placed in a case, there being four copies of each letter, and the letter is also painted at the bottom of the compartment to assist in the resorting. The child is given a letter, a vowel first, and told to touch it. Being already expert in this sort of exercise, he usually does it correctly, but if need be the teacher takes his hand and directs the first

PRELIMINARY MOVEMENTS OF WRITING

and the middle finger properly about the form of the letter, and at the same time the teacher says, "This is *a*," giving, however, the phonic sound, not the name of the letter, thus associating the visual and the tactile and muscular sense with the phonic sound. The child is usually interested in this and repeats it by himself, in some cases many times. The next step is to teach the child to recognize the letter when he hears the sound corresponding to it, so the teacher says to him, "Give me *a*," or whatever the letter is. And the third step, after the letter has been lying on the table for some minutes, is to test the memory and recognition, and the teacher asks the child, "What is this?" the child, of course, being expected to give the phonic sound of the letter. The vowels are usually taught first and the consonants next, but there is no established order, as often the interest of the child in certain words or letters will determine the progress. In giving the consonants the teacher gives the sound of the letter several times, for instance, *m, m, m;* she then combines it with vowels which the child knows, saying *ma, me, mo*, but always finishing with the sound of the consonant, *m, m, m*, and having the child repeat this after her. Besides the individual letters, words are given in the same way. For instance, the word *mano*. The teacher says to the child, "Give me *m*," and so on with

the other letters, giving the phonic sound to each letter, and finally pronouncing the word *mano*, the child always tracing the word with the fingers. This they often do blindfolded, and a very common request in the school-room to the teacher is, "Please blindfold me," or, "Please put the bandage on." Some day when the child has become familiar with the vowels and a part of the consonants, for it is not considered always necessary that the entire alphabet should be learned before he begins to write, he is given a piece of chalk, and having potentially learned to write without ever having had an instrument of writing in his hands, he suddenly finds himself in possession of a new power and thinks he has grown old enough to write. For a few days this acquisition becomes an absorbing occupation. When I marveled at the remarkable accuracy and evenness in the formation of the letters I asked the teacher if the children were given no directions as to evenness of stroke. Her answer was, "They teach themselves." No child is ever told that a letter is faulty, but the practice in tracing the sandpaper letters with the fingers is kept up long after the children are able to write, and in fact they write more by muscular sense than by sight, and if a child is in doubt as to the next letter that he wants to write, instead of looking at the letter he runs his fingers over the card-

LEARNING LETTERS BY TOUCH

board model, so that the muscular training is continued.

In learning to write the child has taken all but one step in learning to read. He knows the letters by sight and the sounds which correspond to them. He has learned, in composing words, to associate those combinations of symbols and sounds with the word and the object or action for which it stands. But he has no practice in translating visual symbols into their meanings. In Dr. Montessori's reading-lessons there is no particular effort made to begin with easy words. That is not necessary, for the child already knows how to read the words as composed by their sounds, since he himself has put them together. The remaining step in learning to read, that is, to silently interpret the visual symbols, is made a game. A number of cards containing the names of objects or actions in script are placed in a box. The objects used were at first playthings. The children were allowed to choose one. The child must read the word mentally, that is, without pronouncing it aloud, and keep it a secret from the others. Then when he gave it correctly he obtained the object to play with as long as he chose. But after a little, to Dr. Montessori's astonishment, the children refused to take the toys, preferring to continue the game of reading to playing with the toys. So they were put away

and the games continued without them. And as in all the plays and games, use is made of the spirit of co-operation. Children are included in the game who do not yet know how to read, and some child who has already learned chooses for the little one who is not yet so far advanced, and gets the desired plaything for him. This particular game is exceedingly popular and can be greatly varied. Names of the children, of objects, of actions which the children are permitted to execute, are all used. And the children continue to carry on this game in their recreation-hours, as well as in the school-period, spontaneously. In passing from words to phrases and sentences the children are given cards on which a direction or a request for some action is written, no particular effort being made to express these in any terms simpler than would be used in ordinary conversation. For example, "Close the window-shutters, open the door, and then wait a moment and put them as they were," and the child carries out the directions.

MAKING WORDS WITH MOVABLE LETTERS

V

NUMBER AND ARITHMETIC

THE elements of number and beginnings of arithmetic are also taught in Dr. Montessori's schools. The children three years old usually can count as far as three when they first come to school. In teaching them to count, the objects about them are used. For instance, it is said to the child, "There are two buttons lacking on your pinafore," or, "Three more plates are needed on the table," or playthings are used as objects of numeration; in general, things at hand rather than any special apparatus. The first definite lessons are in changing money. Actual money is used, care being taken, for hygienic reasons, to procure new pieces. The children first learn the names and values of the coins and then match the larger pieces with the number of smaller pieces required for the equivalent. As further material for teaching, a set of rectangular bars, the so-called long stair, already used in sense-training, is utilized, the longest of these being a meter and the shortest a decimeter

in length, and all divided into lengths of a decimeter, painted alternately red and blue. These are used as aids in counting, and in their different arrangements for the simple processes of addition and subtraction. Little sets of spindles, slightly flattened so that they will not roll from the desk, and colored counters and rods, have also proved attractive material. There are also used two trays divided by strips into five compartments, in which objects may be placed, and large figures are placed in the vertical series, so that a number of objects can be placed in the corresponding compartments of the horizontal board. Various games and exercises are played with this. Froebel's cubes and the disks used in playing quoits or any other convenient material may also be used. The teaching of zero naturally presents more difficulties than the teaching of the digits. A sample lesson on the zero is the following: A group of children stand around the teacher, who says, "Take zero steps." There is an immediate impulse to movement and the teacher says, "But zero is nothing." A second trial, and the children stand still and laugh. Then the teacher tries again, "Come and give me zero kisses." Again the children laugh, but stand still in their places. And so the game goes on, varied with the digits, a lesson in inhibition and self-control as well as arithmetic being skilfully in-

THE LONG STAIR

troduced into the teaching. Another play which involves a lesson in self-control as well as arithmetic is a game in which the children choose from a box on the teacher's desk a folded paper containing a number, which they are to take to their places without showing any one, keeping it quite secret, and having read it, and after its verification by the teacher, they may take the number of objects or playthings from the desk corresponding to the number on the paper. There is generally, at first, a tendency to take a larger number than that called for. But here again the approval of the teacher as to the correct choice becomes a restraining influence. They are at liberty to take more than the number, but the exact number is the thing which wins the teacher's approval. Here, again, the child with the zero has a lesson in self-control, for he is apt to show disappointment in his expression; but it is a part of the game to keep it quite secret, so he, too, comes to learn the value of absolute correctness, and in the end to consider it just as much fun to get the zero, and not let anybody know it, as to draw the nine. There are many other lessons or plays in this school which are not to be found in ordinary schools. The game of silence, for instance, is one which the children not only enjoy, but as they grow more perfect in the game they learn many things about what makes a sound, as, for example,

their own breathing and other movements. They learn to notice the ticking of the clock and the many little noises which, as a rule, do not come into consciousness, and as a means of control the game of silence is often very effective.

It will be noted that refractory children who are not amenable to discipline are dismissed from the *Casa dei Bambini*, but a question as to the actual number of refractory pupils was met with a smile. They occur but rarely, and in Dr. Montessori's view a naughty child is a sick child and to be treated accordingly. In actual practice a child who does not naturally fall into the ways of the school is simply given a little chair and table with playthings apart from the others, and especial tenderness shown him because he is sick and cannot take part in the common life. Suggestion and the natural impulse to imitation are the mental therapeutics employed, but a physician forms a part of the regular staff of every school and the children receive any needful medical treatment.

VI

DISCIPLINE

THE question of discipline in the Montessori schools has naturally given rise to much discussion, for if a child must be allowed to develop in perfect liberty, except in so far as his acts are wrong in themselves or interfere with the interest of others, what becomes of the principle of obedience? Should not a child be brought to obey, as a part of the discipline of life which he must surely meet when he goes out into the world? As a matter of fact, there is prompt and cheerful obedience, to a remarkable degree, in the Montessori schools, but such discipline as this Dr. Montessori thinks could never be obtained by repression, spoken exhortations, or reprimands. Voluntary action cannot be secured merely through commands, and true obedience can be reached only through a complex psychic development. To render obedience it is necessary to know how, as well as to wish to obey, and this knowledge is something which the child has to acquire. When we command a little child who

is absorbed in digging sand to fill a little pail to leave it, we presuppose as already existent in him a power of inhibition of his own desires which he does not possess by nature. It is only as the will is trained by repeated exercise that true obedience, which involves sacrifice, becomes possible. The first dawning of real discipline, according to Dr. Montessori, comes through work. When a child first becomes absorbed in doing something, whether it be one of the exercises in sense-training or learning to lace, or button, or to set the table, he has taken his first step on the road of discipline. Every time a child completes a series of co-ordinated actions directed toward a given end, every time he repeats his exercises, correcting his own errors, every time he accomplishes something which he has undertaken, he is training his positive will-power. In the various games of silence, in the arithmetic lesson on zero, where he learns to restrain his impulses, when he waits for his turn in some game, he is training his powers of inhibition. Again, in the concentration of attention necessary to carry a tureen without dropping it or spilling the soup, he is learning to restrain manifold impulses to activity that are incompatible with the successful accomplishment of the task. He must control his desire to run and jump, to watch what is going on among the other children, and even the impulse to brush away a fly or push back a

fallen lock of hair. Just as in teaching reading and writing the acquisition of the muscular mechanism which is independent of the writing movement should come first as a separate detail, so must the will be developed through methodical exercises which are also mental and practical. To speak of "breaking" a child's will Dr. Montessori considers irrational, because it is impossible to break what the child does not really possess. The process thus called is really preventing a child from forming his own will-power, and its consequence is childish timidity, which is, in Dr. Montessori's view, a moral malady of a will arrested in its development, and is the cause of the lack of individuality and initiative, of which constant complaint is heard in educational discussions. It is also pointed out that there are three stages in the development of a child's capacity to perform an operation. First, a subconscious one, in which the child, by groping dimly, succeeds in doing a thing, but cannot reproduce it at will—a stage readily observed in all baby efforts; second, a conscious stage, when the child can voluntarily reproduce an act when he tries by himself or under favorable circumstances, but makes mistakes if asked to do it, not yet having complete control of the necessary mechanism; and, lastly, the complete mastery of the act which enables the child to voluntarily respond to the command.

Obedience follows a similar order of development. When in the first, confused stage the child does not obey a command, it is as if he were psychically deaf. He hears, but does not understand. In the second stage he seems to understand, but has not yet the complete command of his inner processes that enables him to complete the external act promptly, and we say that he is not quick to mind. In the third stage he obeys promptly and cheerfully, showing pride in his knowledge of how to obey. A child thus trained is not only obedient, but he is self-disciplined and has acquired a poise and calm that orders his actions and deepens and enlarges his moral life. This analysis of Dr. Montessori's is entirely in accord with the results of special studies of obstinacy which show this to be not, as is popularly supposed, evidence of a strong will, but as due rather to a weakness of will, which the child cannot overcome. He may even wish to obey, and yet persist in his disobedience from inability to overcome the psychic cramp. Some of these cases are real tragedies of childhood which might be avoided by an enlightened teaching of obedience. Suppose, for instance, a child refuses to take a needed dose of castor-oil. Repulsion for anything nauseous is instinctive, and it is unreasonable to expect a child to overcome such a repulsion if his will has had no previous training, and cer-

tainly this particular occasion is not an especially favorable opportunity for beginning the process. Is it just to call a child naughty and disobedient when he is really suffering from lack of preliminary training of his will? It is only the willing obedience of a child that is self-disciplined that Dr. Montessori believes to be of value for the development of character.

VII

PHYSICAL DEVELOPMENT

TAKEN in its entirety, Dr. Montessori's system involves physical as well as mental development, and in her schools simple apparatus adapted to the needs of the children and exercises both for development and grace of movement are given.

The system of gymnastics, or muscular education, consists of a series of exercises adapted to securing the normal development of the natural physical movements — *i. e.*, walking, respiration, talking, or if any anomalies are present aiming at their correction. The years between the ages of three and six Dr. Montessori considers a most important period for muscular training. During these years the proportions of the child's body are very different from those of the adult, the trunk being relatively much longer and the legs shorter and weaker than those of the adult; growth is rapid; the relative proportions of the different parts of the body are rapidly changing, and the skeletal development is still incomplete; hence there is danger of too great a strain on the

long bones, especially those of the legs, which, being still more or less cartilaginous, may yield under the weight of the body, producing the curvature known as bowed legs. Among the children of the poor, who are often undernourished, and whose diet is deficient in bone-building material, this deformity is only too common. The natural tendency of the child to accomplish locomotion on all-fours, as in its early stage of creeping, and continued in plays and activities even after he has learned to walk, is normal and hygienic, and a system of gymnastics adapted to little children must take into consideration this relative weakness of the legs.

A very simple piece of apparatus, consisting of parallel-bars on one of which the feet rest while the other is grasped by the hands, is admirably adapted to giving a great variety of muscular exercises and to developing the leg muscles, while at the same time partially relieving them from the weight of the body.

Another device adopted by Dr. Montessori from Séguin, designed not only for strengthening the legs but also the knee-joints of weak children, consists of a swinging chair in which the legs are supported at full length. The chair is suspended in such a way that the soles of the feet come in contact with a vertical plank or the wall, thus keeping the swing in motion.

The pendulum play, in which the children sit on stools about a rubber ball suspended by a cord and strike it alternately, affords excellent exercise for the muscles of the back. A rope-ladder with wooden rungs also permits a large variety of healthful exercise, jumping, stretching, swinging, etc., without danger of falls or overstraining of the legs.

A somewhat unusual piece of apparatus is a low, circular staircase with height and width of the steps carefully adapted to the size of the child and protected on one side by a rail. This serves to teach the children the proper method of going up and down stairs, and also aids in securing the poise, grace, and certainty of movement so noticeable in the Montessori children.

But gymnastic training is by no means confined to the use of apparatus. Free gymnastics and free play have also their part in physical training. Marching accompanied by singing at the beginning is considered of a special value, because it furnishes not only a breathing exercise, but one of a kind perfectly adapted to developing the vocal organs. In this marching Dr. Montessori thinks that equilibrium should be sought, rather than rhythm. Some of the Froebelian plays similar to those which are in constant vogue among the children are also used, and there is free play with balls, hoops, bean-bags, kites, pails, sticks, wheelbarrows, and other implements

so dear to childhood. The trees and corners of the courtyard also afford opportunity for plays similar to our game of puss-in-the-corner.

Great stress is laid upon breathing exercises and upon vocal gymnastics, special care being taken to strengthen and train the vocal muscles so that careless and defective speech may be avoided, or corrected if it already exists. Part of these exercises, indeed, are directly taken from those introduced by Professor Sala for the cure of stuttering.

The care of plants and animals and work in the open air with all its healthful accompaniments form no unimportant part of the system not only of physical but mental and moral training, for through this means the child is initiated into the observation of the phenomena of both animal and vegetable life. His sense of responsibility is developed, for he learns by actual experience that the plants are dependent upon him for growth, through his watering, and the animals for their food. He also acquires lessons in patience and faith as he waits for the seeds he has planted to spring up, and he becomes familiar with the processes of nature.

A certain amount of manual training, including modeling in clay and building with blocks and sticks, is also used by Dr. Montessori as affording constructive work of a valuable kind.

VIII

RESULTS IN PRACTICE

ONE of the most interesting parts of the day's programme to the visitor at the Via Giusti is the serving of lunch by the children themselves. The signal was given by a march played on the piano, and one by one the children laid aside their work, carefully putting away materials so as to leave the little tables free, fell into the line of march, and finally took their places in order at the tables, where a simple grace was repeated in concert before sitting down. Two of the children, four and a half and five and a half years old, respectively, chosen for the honor of serving the others, placed the plates and spoons, and then passed the tureens of hot soup which the sister in charge had placed on the serving-table. Most of the children served themselves from the tureen, but for the youngest the service was performed by the little waiters. Not a drop was spilled, not a plate emptied without the notice of the watchful little servers, who evidently enjoyed the responsibility of their task. When the soup was

finished the plates were changed, and a second course and simple dessert served by the same deft little waiters, who also cleared the tables when all had finished. The perfect poise and grace of the children who served were beautiful to see, and certainly bore witness to the efficiency of the system of muscular training. In fact, this ease and accuracy of movement is one of the most striking things in a Montessori school. Even making due allowance for the fact that Italian children are naturally graceful in their movements, a room in which thirty or forty children move about freely with perfect poise and never blundering against chairs, tables, or each other, is certainly an unusual sight, and inclines one to accept Dr. Montessori's conclusion that the years between three and six are among the most important for muscular training and acquirement of equilibrium. Psychologists have long since learned the importance of nascent stages of development, and the fact that if such a stage is allowed to pass without favorable opportunities for exercise the loss can never be fully made up at a later stage.

The lunch-hour is followed by a period of free play in the garden and a rest-hour, when some of the children sleep and others merely lie down for a quiet time.

Dr. Montessori lays stress on diet, and in the philanthropic schools, where the children are given

at least their noon meal, this can be to some extent carried out, for it is the development of the whole child that Dr. Montessori seeks. As yet Dr. Montessori has not carried out her method experimentally beyond the kindergarten age—that is, three to seven years—but she has during the last year withdrawn as far as possible from other active work in order to devote herself to the study of a continuation of her system through the grades. A preliminary experiment in a first-grade room of the common schools of Rome in 1910–1911 is of interest here.

The class was formed October 26th and thirty-one children were registered, but of these six were removed by the medical inspector, two were found to have already had some instruction in reading, and two removed from the locality. Twenty of the children remaining in the class were either already six years of age or reached their sixth birthday before January 1st; one was a backward child of nine, arrested in physical development, and whose mental development appeared to be inferior to that of the children of six. To the twenty-one children thus regularly enrolled were added, for the sake of experiment, two children taken from private kindergartens, who, being only five years old, were too young to be regularly enrolled in the public schools.

As the experiment was conducted in an ordinary

LEARNING TO BUTTON

school-room, furnished with the usual stationary desks and seats, instead of being equipped in accordance with the new method, the conditions were by no means ideal for securing the physical liberty of the pupils, deemed by Dr. Montessori so necessary for free intellectual and moral development. The didactic material for teaching reading, writing, and arithmetic was not received until January 15th, and the time from October 26th to that date was spent in sense-training, and especially in muscular and practical exercises —*i. e.*, in developing freedom of movement and independence in waiting upon themselves. All these children had been in a kindergarten, but the teacher found them lacking in spontaneity, and complained that they confused goodness and discipline with immobility and silence, so that it was by no means an easy task to inspire them with the idea of freedom in both physical and intellectual movement and individual self-discipline, which are fundamental characteristics of the Montessori method.

The auto-sensorial education was carried on by means of the material which Dr. Montessori has scientifically adapted to the purpose. But this sense-training is not limited to the mere reception and retention of the things observed, for the children not only use their powers of observation, but they draw their own conclusions and apply

their acquired knowledge in every way possible. The interest and unhampered energy of the child being the mainspring of the progress, the teacher noted that the mental food was always adapted in quality and right in quantity for the assimilation of the individual child, and she herself marveled at the results of this spontaneous evolution. With the simple phonic method of teaching the vowels and consonants already described, with simultaneous stimulus of the visual, tactile, muscular, and auditory sensations, the pupils began spontaneous composition before they had learned the whole alphabet, and were thus stimulated to acquire the sounds and symbols which they lacked. There were great individual differences, and the period of learning all the letters of the alphabet and the different combinations into words varied from five to thirty days for the different pupils. It is to be remembered, however, that the learning to read and write is merely the culmination of the previous sense-training. Generally, the learning to read, which began with exercises in composition by means of the movable letters, followed by reading of lesson-cards of the first, second, and third grades, preceded the phenomena of spontaneous writing. After this stage was reached progress became more rapid.

When the school closed on June 17th, eighteen of the children, including the two five-year-olds,

passed the examination for the second grade. Several of them had surpassed the requirements, being able not only to read and write readily, but also to read and write numbers beyond 100,000 and to perform addition and subtraction with four, five, and six figures. Some of them developed a great fondness for arithmetic and amused themselves by making examples on which to exercise their newly acquired powers. Of the five who did not entirely complete the work of the first grade one was the backward nine-year-old, one a child with hereditary defects who could not speak plainly, and one a child handicapped by malnutrition. The two others were very near reaching the standard, but as the normal and spontaneous development of the child is the aim of the system no effort to hasten their progress was made. Perhaps the most interesting thing in the experiment is the fair opportunity for each child to develop in accordance with his own abilities without forcing and without retardation, the more gifted children as well as those less amply endowed doing the work suited to their capacities and doing it happily and with a sense of conquest, for the dullest of these children had no sense of discouragement or failure. So unconscious are they of being taught that one of them, exulting in the newly discovered ability to write, naïvely asked her teacher, "Can you write?"

IX

APPLICATION IN AMERICAN EDUCATION

IN applying the system to the education of American children certain adaptations and modifications will be necessary. The social conditions of Italy and those of the United States are very different, and equal co-operation on the part of the American parent is hardly to be expected. Moreover, Italian children are physically more precocious, more impressionable, and at the same time apparently less nervous and less self-assertive than American children, so that fewer problems of the kind that we are wont to call disciplinary arise than is likely to be the case among our own children. Nor can we expect to attain the same results in the development of spontaneous reading and writing that have attracted so much attention in the case of Italian children, for Italian is a phonetic language and English is not. When an Italian child has once mastered the forms and sounds of the alphabet he can spell any word that he knows or hears, and, since his written vocabulary is equal to his

spoken one, writing immediately becomes for him a new mode of self-expression and communication in which he is absorbingly interested.

The American child, on the contrary, who wants to write "I can tie my shoe" is forced to choose between the samples offered in *my*, *eye*, *high*, *buy*, or *lie*, and must puzzle his brain to decide whether shoe shall be written after the analogy of *too*, *two*, *chew*, *blue*, or *through*—*i. e.*, his written vocabulary is limited to the words he has learned to spell, and this involves a psychological loss; for, instead of the free expression which is possible for the Italian child, his thought is hampered just as it is in beginning to speak a foreign language, when the vocabulary is still inadequate for complete expression. Since this difficulty is one inherent in our language, even the Simplified Spelling Board will hardly be able to entirely remove it; but although the spontaneous reading and writing have probably attracted popular attention more than anything else, it is really a minor point, an incidental product of the system whose object is to train the whole child to physical, mental, and moral efficiency.

We already have excellent systems of teaching reading, and probably no teacher who has used the word-method would be willing to discard it in favor of an alphabetic one; but would it not be possible to apply Dr. Montessori's fundamental

principle of using three senses instead of one to the word-method and by this combination overcome the phonetic difficulty? And even though our children may not spontaneously burst forth into writing like the Italian children, have we, apart from this incidental product, a system of teaching writing which is as scientific in its basis and as successful in its results?

The question is often asked, "But was not the principle of spontaneous self-development Froebel's aim? How does this differ from the kindergarten?" It is, of course, true that no educational system that is really worth while is a wholly new construction, for the history of science is one of gradual growth: that which is of permanent value survives and is incorporated in the new. Froebel believed in the spontaneous development of the child and in the utilization of its natural interests. So does Dr. Montessori. Froebel used his gifts as material for developing the child. Dr. Montessori also uses material, and, moreover, some of it is actually the kindergarten gifts; but instead of a limited amount of stereotyped material given to every child in a particular order which corresponds to a theoretical philosophical system, which is characteristic of the older kindergartens, though far less so for the most progressive type, Dr. Montessori furnishes a multiplicity of material whose forms are based,

THE BROAD STAIR—DISCRIMINATION OF FORM AND SIZE

not on philosophical theory, but on results of scientific experiment, and all that modern psychology has discovered in regard to the development of the senses and intelligence. In the kindergarten the group is the basis of instruction, and all the children of a group do the same thing at the same time. In Dr. Montessori's system the instruction is almost entirely individual; and the natural group, which is usually small, arising from a common interest among the children themselves, takes the place of the artificial kindergarten group, and perhaps Dr. Montessori's greatest pedagogical achievement is the fact that her system has, for the first time, made possible the individual instruction of numbers of children; for classes of twenty-five or even thirty-five children can be directed by one trained Montessori teacher and an assistant, though here, as in the kindergarten, a smaller number is the ideal. Groups of forty or fifty children, as often seen in our public-school kindergartens, were certainly not Froebel's ideal.

The type of work and training required of the Montessori teacher is of a different kind from that required of our kindergarten or primary teachers, but there is less strain. The teacher becomes a scientific observer, who must know just what change is required in the environment of the child to allow him to continue his own in-

struction and just how to repress that which is undesirable. Froebel's motto was, "Let us live with our children, play with them, direct them into the manifold life of the Universe." Dr. Montessori would not direct the child from without, but would remove all obstacles and let him develop himself, attaining perfection through self-correction. In the kindergarten, while a certain liberty of choice on the part of the child is allowed, the teacher, nevertheless, directs the programme for all the children, while in the Montessori class every child is doing what he wants most to do, and sometimes no two children are doing the same thing.

Another point of difference lies in the distribution of time. In the kindergarten the time allotted to each occupation is very short, the theory being that a child's attention is easily fatigued, and that he should have carefully adjusted diversity of occupation, and this is quite true of directed attention; but there is a steadily accumulating amount of evidence to prove that this is not the case with self-directed attention, and it is chiefly this which is fundamental in the Montessori method of training. Consequently, when a child wishes to spend the entire two hours of the school-period in doing one thing he is allowed to do so, and he often does it. Another point which was not originally emphasized in

kindergarten training, although its importance is now being recognized by the more progressive kindergartners, is the muscle and touch training, on which so much stress is laid in the Montessori system. The systematic physical development of the child by means of apparatus and free gymnastics is also a characteristic which is not a part of the kindergarten system, and this results in an ease, grace, and accuracy of movement which, even making due allowance for the fact that Italian children are naturally graceful, must be credited with results greatly to be desired for all children. In spite of these differences there is much in the Montessori system which will certainly be welcomed by progressive kindergartners. Some of its methods, indeed, have already been developed by them, and could the creative genius of Froebel have had the broad scientific training which has helped Dr. Montessori to place her system on a sound psychological basis the differences between them would probably have been far less than they now appear.

Within recent years we have had in Germany and the United States published reports of children who, according to our usual estimate, are mental prodigies; who, like Dr. Sidis's son or the children of Dr. Berle and Professor Wiener, of Harvard, are prepared for and do enter college at ages varying from eleven to fourteen years. It is claimed

by the parents of these children that their remarkable proficiency is due not to special natural endowments, but to methods of training. And it is interesting to note that these methods of training, though never formulated into a system, and differing somewhat among themselves, and having the emphasis laid on different factors, have nevertheless certain principles in common, and these agree with those laid down by Dr. Montessori: the conservation of the natural energy, of natural interests, early training in self-reliance, in habits of attention and quick, correct thinking, and this without forcing. Dr. Sidis emphasizes suggestion more than the others, but he too declares that the chief aim in education is to train the child to make "any habitual and profitable use of his hidden energies."

In these days of keen competition in professional and business life, when more and more specialized training is required, the question of the conservation and utilization of natural energy becomes of great import. We have had critics in plenty of our school systems and their lamentable deficiencies, and endless discussions as to where time might be saved; but of constructive work, of demonstrated efficiency, Dr. Montessori's schools furnish a challenging example.

LEARNING TO TIE

X

AN AMERICAN TEACHER'S EXPERIENCE

OUR experiment in introducing the Montessori method into our open-air kindergarten, itself a pioneer effort, began last September under the following conditions. I had read the article by Miss Tarbell, in the *Forum*, on Dr. Montessori's work, and had purchased an Italian copy of *Scientific Pedagogy*, by Dr. Montessori. We had no apparatus, and neither my teachers nor myself had seen the method applied in other schools. Favorable impressions made by the article upon my mind were confirmed by the book. I was convinced that here were definite advances in education along a line that had always appealed to me. Having under my care a kindergarten and a primary department in a school where the watchword is "Progress," I was encouraged to apply the methods suggested in the book, and did so. Difficulties in regard to material and in regard to application of the methods had first to be confronted. At that time, I need hardly add, we had no firm to manufacture

material for American children, and knew of no copyright. I saw from the first that the foreign apparatus would not serve our purpose; the forms of the script letters, for instance, were not what we wished, and for that reason we did not order from abroad. The cheerful co-operation and help of my primary teacher and of my two kindergartners assisted greatly in obviating their difficulties. They were as deeply interested in the new experiment as myself, and eager to be initiated into its mysteries. We met at stated times during the week in the afternoons. I read a portion of the book, translating as I read, and we all discussed the matter therein contained. We made no sudden general change in either kindergarten or primary rooms, but introduced gradually whatever new features we had taken up and thought suited to our conditions. As we progressed we made our apparatus according to the directions given in the book, and illustrated by the pictures in the appendix. We were much amused over the results of many of our attempts at the time, and never really felt satisfied with any of our achievements in the way of apparatus. However, since receiving our partial set from the "House of Childhood" we have congratulated ourselves on coming even as near as we did to the real thing. The wooden insets, made by a carpenter according to directions,

LEARNING TO HOOK

were never a success. They were too large and stuck persistently, even after repeated "shavings," and we substituted our own attempts in pasteboard. In all other articles we succeeded fairly well, and by December our small children in the kindergarten were buttoning, hooking, tying, lacing, fitting pasteboard insets, tracing cardboard letters with the proper fingers, and arranging daintily pretty color-sets. In connection with this work we continued the modeling, cutting, motion songs, and games of the kindergarten. Our furniture we did not need to change; the individual tables and chairs were already a feature of our appointments. Since then we have added the tables made by the "House of Childhood," as they are lighter than our former ones.

Up to this time the idea of an organized Montessori movement in America had not occurred to us; we were simply carrying on an individual experiment, pleasing to us, in our individual way.

About the middle of December it was decided, because of the interest that our experiment was exciting, that I should visit the schools in Rome in order to see the method in operation. This plan was carried out, and during January it was my good-fortune to see the system in working order throughout the classes of schools in which it has been adopted at Rome. Interviews with Dr. Montessori herself served to heighten the

impression of sincerity, understanding, and power already conveyed by her writings. Results of the method shown in the schools made me absolutely sure that certain definite results in the field of muscular control were obtained in a natural way by her methods and her apparatus—results never, so far as I know, brought about by any other system. This one practical outcome of the correlated technical training for writing was the first thing that attracted my attention to Dr. Montessori's system. It is still, to my mind, the point that has the greatest significance for education. In the Montessori schools at Rome the long daily session, with its repeated periods for exercising the muscular power, brings about results almost marvelous. All who have read Dr. Montessori's book must regard her achievement in causing the children to write almost intuitively as the flower of the whole system. Those who have seen children of five years in Rome writing with apparent spontaneity whatever they wished to say have found the actual living results more surprising than those recorded by Dr. Montessori herself. I would that I had such a dramatic result to relate in regard to the blossoming of our pupils into script. That I have no such story is not the fault of the method, but due to our lack of the facile Italian phonetics and our individual limitations in time.

USING GEOMETRIC INSETS

Our session for these small children lasts only two hours daily, a fact greatly restricting our results in this field, where Italian children labor from 9 A.M. to 5 P.M. Our intricate inheritance both of vowel and of consonant sounds contributed its force to hold us back. In spite of both handicaps we consider our experiment a triumph; our children of five did write—not overflowing, it is true, into cascades of words or connected sentences, but putting down in plain, easy script names of objects familiar to them, words not dictated nor copied, words of their own creation. After the systematic use of simple correlated, practical material, after the training of the muscular power by exercises, passing from tactile-sense to definite and delicate reproduction of geometric and letter outlines, after phonetic training in every letter and familiar knowledge with its written form both by sight and touch, the result was natural and inevitable. Given the loose script letters, they would group them into words, and just as naturally and just as inevitably record with pencil or with crayon the words so constructed.

That is the result of our experience, limited and hampered as it was. With time the next step—that of expressing connected thought—would have come easily and simply. It is my conviction now, as it was before we tried our

experiment, that in her method Dr. Montessori offers at least two great practical gifts to education aside from the big idea of liberty—an idea which, if not new, is by no means universally adopted at this time. The two gifts I mean are the relief of the eye by continuing and developing the sense of touch, and the technical assistance in teaching children to write. These are the advantages of the method which no other method has. They are the reasons why we shall continue to use the system, hoping to accomplish more with it as our own skill in applying it becomes greater.

THE END

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